

DITZEL et al.
Appl. No. 10/529,723
December 4, 2008

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AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1 (currently amended). A fluid bed process for the production of an alkenyl carboxylate comprising reacting an alkene, a carboxylic acid and a molecular oxygen-containing gas in a reaction zone in the presence of a catalyst at an elevated reaction temperature, T, to produce an outlet stream from the reaction zone comprising alkenyl carboxylate and oxygen,

wherein during a process upset, ~~start-up~~ or shut-down, when the catalyst is contacted with the alkene, at a partial pressure, P, optionally in the presence of the carboxylic acid, and the outlet stream comprises less than 2vol% oxygen, the partial pressure of the alkene is reduced to at least 50% less than P and/or the reaction temperature is reduced to below 100°C so as to suppress formation of benzene and/or suppress inhibition of the catalyst,

the period of time, Z, during which the catalyst is exposed to the alkene in the presence or absence of the carboxylic acid and at oxygen levels of less than 2 vol % oxygen before the partial pressure of the alkene is reduced to at least 50% less than P and/or the reaction temperature is reduced to below 100°C being in the range >0 to 12 hours.

DITZEL et al.
Appl. No. 10/529,723
December 4, 2008

2 (original). A process as claimed in claim 1, wherein the catalyst is contacted with alkene and carboxylic acid, and the outlet stream comprises less than 2 vol% oxygen.

3 (previously presented). A process as claimed in claim 1 or claim 2, wherein the outlet stream comprises 0 to 0.5 vol% oxygen.

4 (previously presented). A process as claimed in claim 1 or claim 2, wherein the alkenyl carboxylate product comprises less than 100 ppb benzene.

5 (previously presented). A process as claimed in claim 1 or claim 2, wherein the partial pressure of alkene, P, in the reaction zone is at least 0.3 bar or greater.

6 (canceled).

7 (currently amended). A process as claimed in claim 1 or claim 2, wherein the partial pressure of alkene in the reaction zone is reduced by removing substantially all the alkene from the reaction zone.

8 (previously presented). A process as claimed in claim 7, wherein the alkene, optional carboxylic acid, and any oxygen present, are removed from the reaction zone by purging the reaction zone with an inert gas.

DITZEL et al.
Appl. No. 10/529,723
December 4, 2008

9 (canceled).

10 (previously presented). A process as claimed in claim 1 or claim 2, wherein the reaction temperature is reduced to at least 20°C below T.

11 (canceled).

12 (previously presented). A process as claimed in claim 1 or claim 2, wherein the catalyst comprises a Group VIII metal, a promoter and optionally a co-promoter.

13-30 (canceled).

31 (previously presented). A process according to claim 1, wherein the temperature in the reaction zone, T, is in the range 100°C-400°C and the pressure in the reaction zone is from atmospheric pressure up to 20 barg.

32 (previously presented). A process as claimed in claim 3, wherein the outlet stream comprises 0 to 0.2 vol% oxygen.

33 (previously presented). A process as claimed in claim 5, wherein the alkene, P, is ethylene and partial pressure in the reaction zone is at least 1 bar.

DITZEL et al.
Appl. No. 10/529,723
December 4, 2008

34 (previously presented). A process as claimed in claim 33, wherein the partial pressure in the reaction zone is at least 2 bar.

35 (previously presented). A process as claimed in claim 8, wherein the inert gas is nitrogen.

36 (currently amended). A process as claimed in claim 9 1 or claim 2, wherein the reaction is carried out at a temperature, T, of at least 140°C.

37-47 (canceled).

48 (new). A process as claimed in claim 1 or claim 2, wherein the reaction temperature is reduced to 50°C or lower.

49 (new). A process as claimed in claim 10, wherein the reaction temperature is reduced to at least 50°C below T.

50 (new). A process as claimed in claim 1 or claim 2, wherein the catalyst is in contact with the alkene, and optionally the carboxylic acid, at low levels of molecular oxygen, for >0 to 6 hours prior to reducing the partial pressure of the alkene and/or reducing the reaction temperature.

DITZEL et al.
Appl. No. 10/529,723
December 4, 2008

51 (new). A process as claimed in claim 1 or claim 2, wherein the catalyst is in contact with the alkene and the carboxylic acid, at low levels of molecular oxygen, for >0 to 6 hours prior to reducing the partial pressure of the alkene and/or reducing the reaction temperature.